

A SYNOPSIS OF THE UNAOWNED GRASSES OF FORMER MADRAS PRESIDENCY

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ABSTRACT

The grass flora of the former Madras Presidency—constituting the present States of Andhra Pradesh, Kerala, Tamil Nadu and parts of Karnataka—is represented by 146 genera, excluding subfamily *Bambusoideae*. This paper deals with the identification of 63 genera of unawned grasses and supplements an earlier paper on awned grasses (Karthikeyan, 1972).

INTRODUCTION

Fischer (1934 & 1936) reported 128 genera of grasses excluding bamboos for the former Presidency of Madras. He included the genus *Melica* L. with a single species *M. scaberrima* (Nees ex Steud.) Hook. f. which is Himalayan in distribution due to wrong identification of specimens collected from Nilgiris by Gamble with field numbers 18129 and 21378 based on which Bor (1948) published a new species, *Poa gamblei*.

A thorough search in *MH* and *CAL* for specimens of *Melica scaberrima* (Nees ex Steud.) Hook. f. leads to conclude that the genus *Melica* does not occur in the area covered by this study.

The changing taxonomic concepts had split some of Fischer's genera with the result 9 more genera have been added. Vari-

ous botanists have added another 10 more genera either as new records to this area or as new to science. The grass flora of the former Madras Presidency now comprises 146 genera—83 genera of awned and 63 of unawned or muticous grasses.

The group Panicoideae contains more unawned grasses than the Pooideae. When compared with awned grasses which have been treated earlier (Karthikeyan, 1972) the tribe Andropogoneae (group Panicoideae) has more genera and species of awned grasses than unawned; the tribe Paniceae of the same group contains more unawned grasses than awned, while the group Pooideae has more genera of awned grasses though the number of species of both categories is more or less the same. The tribe Maydeae has no awned grasses at all.

Name of the group

Panicoideae

Tribes

Andropogoneae

Maydeae

Paniceae

Pooideae

Awed grasses

Unawned grasses

No. of Genera	No. of species	No. of Genera	No. of species
33	142	9	15
6	13	5	8
44	101	20	94
44	101	29	102
83	256	63	219

Total

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KEY

An artificial key has been provided to help in identification of the genera of unawned grasses in the area under discussion.

[For key to the groups of *Gramineae* viz., *Panicoideae* & *Pooideae*, see *Karthikeyan* (1972)].

Key to the tribes of **Panicoideae**

1. Male and female spikelets in separate inflorescences or in different parts of the same inflorescence and of different appearance ; lemmas hyaline or membranous and thinner than the glumes ... *Maydeae*
1. Spikelets all hermaphrodite, or with male or barren and hermaphrodite spikelets mixed in the same inflorescence and so arranged that a male or barren spikelet is near a hermaphrodite spikelet or if unisexual then the lemma of the fertile floret indurated ... *Andropogoneae* & *Paniceae*

[For key to the tribes *Andropogoneae* & *Paniceae*, see *Karthikeyan* (l.c.)]

Genera of unawned grasses of the tribe **Andropogoneae**

<i>Eremochloa</i> Buse	<i>Hemarthria</i> R. Br.	<i>Ophiuros</i> Gaertn. f.
<i>Eriochrysis</i> P. Beauv.	<i>Imperata</i> Cyr.	<i>Rottboellia</i> Linn. f.
<i>Hackelochloa</i> O. Ktze.	<i>Mnesithea</i> Kunth	<i>Saccharum</i> Linn.

1. Joints and pedicels free
 2. Inflorescence of panicles ; both spikelets well developed
 3. Spikelets enclosed by white hairs
 4. Spikelets 2-nate, one pedicelled and the other sessile ; panicles effuse ... *Saccharum*
 4. Spikelets 2-nate, one short—the other long-pedicelled ; panicles narrow ... *Imperata*
 3. Spikelets enclosed by rufous hairs ; inflorescence a contracted panicle of spiciform racemes ; spikelets 2-nate, one sessile the other pedicelled ; glume-margins long rufous-ciliate ... *Eriochrysis*
 2. Inflorescence of solitary, spiciform racemes ; spikelets 2-nate, pedicelled spikelet reduced to a rudimentary pedicel ; sessile spikelet imbricating, dorsally compressed ; lower glume thickly coriaceous, nearly flat, broadly ovate or elliptic, acute, the margins pectinate with long spinules or rigid hairs, often winged at the apex ... *Eremochloa*
1. Joints and pedicels fused
 5. Racemes solitary
 6. Racemes cylindric
 7. Sessile spikelets in pairs at each node of the axis ; all joints and spikelets uniformly developed and apex of the raceme not appendaged like a tail ... *Mnesithea*
 7. Sessile spikelets solitary at each node of the axis ; joints and spikelets reduced towards the apex of the raceme and forming a tail-like appendage ; lower glume of sessile spikelets often narrowly winged on both sides near the apex ... *Rottboellia*
 6. Racemes compressed ; lower glume of sessile spikelet constricted abruptly at the apex into a blunt often bifid point ... *Hemarthria*
 5. Racemes fascicled or corymbose
 8. Lower glume of the sessile spikelet subglobose, cartilaginous, pitted ; racemes fascicled ... *Hackelochloa*
 8. Lower glume of the sessile spikelet thickly coriaceous, nearly flat, oblong, obtuse, smooth or pitted in rows ; racemes corymbose ... *Ophiuros*

Genera of unawned grasses of the tribe **Maydeae**

<i>Chionachne</i> R. Br.	<i>Euchlaena</i> Schrad.	<i>Zea</i> Linn.
<i>Coix</i> Linn.	<i>Tripsacum</i> Linn.	

1. Axes of female spikelets not fused
 2. Male and female spikelets in the same inflorescence
 3. Female spikelet enclosed by a structure formed by the hardened lower glume or imbedded in the joints of the rhachis
 4. Male spikelets at the apex, female spikelets imbedded in each joint of the rhachis, so that the smooth cartilaginous axis and the lower glume form a nearly cylindric mass ... *Tripsacum*
 4. Racemes entirely male or with 1 or more female spikelets at the base ; lower glume of female spikelets thickly coriaceous, embracing the rhachis and enclosing the upper glume and floret ... *Chionachne*
 3. Female spikelets entirely enclosed in a globose or ovoid basal bract through which the rhachis grows out and bears the male spikelets above ... *Coix*
 2. Male and female spikelets in different inflorescences ; male spikelets collected in a terminal panicle ; female spikelets single, on opposite side of a thickened, zig-zag, jointed rhachis, sunken in its cavities, the hardened lower glume closing the cavity ... *Euchlaena*
1. Axes of female spikelets fused into a spongy sub-cylindric core ; female spikelets 2-nate in 4-11 longitudinal rows, slightly immersed in the axis ; styles several cm long, exerted in long silky tassels from the sheathing bracts ... *Zea*

Genera of unauned grasses of the tribe Paniceae

<i>Axonopus</i> P. Beauv.	<i>Ichnanthus</i> P. Beauv.	<i>Sacciolepis</i> Nash
<i>Brachiaria</i> Griseb.	<i>Ottochloa</i> Dandy	<i>Setaria</i> P. Beauv.
<i>Cenchrus</i> Linn.	<i>Panicum</i> Linn.	<i>Spinifex</i> Linn.
<i>Cyrtococcum</i> Stapf.	<i>Paspalidium</i> Stapf	<i>Stenotaphrum</i> Trin.
<i>Digitaria</i> Haller	<i>Paspalum</i> Linn.	<i>Trachys</i> Pers.
<i>Eriochloa</i> Kunth	<i>Pennisetum</i> Rich.	<i>Urochloa</i> P. Beauv.
<i>Holcolemma</i> Stapf & G. E. Hubb.	<i>Pseudechinolaena</i> (Hk. f.) Stapf.	

1. Both sexes mixed in all spikelets
2. Inflorescence of spiciform racemes (rarely paniced as in *Digitaria wallichiana*) arranged on a common axis
3. Spikelets solitary, binate or ternate, not clustered
4. Lower glume well-developed
 5. Lower glume turned away from the axis
 6. Spikelets flattened or depressed ; upper lemma mucronate ... *Urochloa*
 6. Spikelets usually turgid ; upper lemma acute ... *Paspalidium*
 5. Lower glume turned towards the axis ; spikelets more or less dorsally compressed ... *Brachiaria*
4. Lower glume usually absent, if present, minute, scale-like
 7. Spikelets elliptic or elliptic oblong or lanceolate
 8. Spikelets sessile ; upper lemma involute at margin ; leaf blades rounded at apex ; sheaths strongly compressed and keeled on the back ... *Axonopus*
 8. Spikelets pedicelled ; upper lemma flat in the margin ; leaves acute or acuminate ; sheaths not as above ... *Digitaria*
 7. Spikelets orbicular, oblong or ovate, secund, 2-seriate ... *Paspalum*
3. Spikelets 1-6, clustered
 9. Spikelets solitary or 2-4, enclosed in an involucre of bristles or spines thickened and united at the base into a cup ... *Cenchrus*
 9. Spikelets 1-6, mixed with small scale like rigid empty glumes ; rhachis rigid, flat, broad ... *Trachys*
2. Inflorescence of panicles
 10. Spikelets usually subtended by an involucre of bristles
 11. Lower lemma not channelled
 12. Bristles rigid ; upper lemma often rugose or transversely striate ... *Setaria*
 12. Bristles rather soft ; upper lemma more or less smooth ... *Pennisetum*
 11. Lower lemma with a median longitudinal channel ; spikelets fascicled or solitary together with or replaced by bristles at the lower nodes, upper nodes bare ... *Holcolemma*
 10. Spikelets not subtended by bristles
 13. Spikelets without an annular callus at the base
 14. Spikelets gibbous
 15. Spikelets strongly laterally compressed
 16. Upper glume with rows of transparent spots between the nerves, naked or with short or long hooked hairs or bristles from the spots ... *Pseudechinolaena*
 16. Upper glume glabrous or hairy, not transparent spotted & hooked bristly from them ... *Cyrtococcum*
 15. Spikelets not laterally compressed, turgid ; upper glume with a saccate base, 5-13 ribbed ... *Sacciolepis*
 14. Spikelets not gibbous (gibbous only in *Panicum sparsicomum*)
 17. Rhachis slender or stout, spikelets not sunken
 18. Upper glume as long as or longer than the upper lemma ; spikelets not clustered
 19. Upper lemma with 2 lateral basal appendages ... *Ichnanthus*
 19. Upper lemma without basal appendages ... *Panicum*
 18. Upper glume much shorter than the upper lemma ; spikelets in clusters ; upper lemma apiculate at apex ... *Ottochloa*
 17. Rhachis flat, bearing 1-8 spikelets sunk in hollows ; panicles spiciform ; lower glume sometimes scale-like ... *Stenotaphrum*
 13. Spikelets with an annular callus at the base ; lower glume reduced to a minute cupular rim clasping the callus ; upper glume and lower lemma finely white silky ... *Eriochloa*
 1. Male and female spikelets in different headlike, globose inflorescences ; bracts pungent ; leaves rigid, thickly coriaceous, involute, recurved ; in sea-shores ... *Spinifex*

Genera of unauned grasses of the group Pooideae

<i>Aeluropus</i> Trin.	<i>Ehrharta</i> Thunb.	<i>Hubbardia</i> Bor
<i>Briza</i> Linn.	<i>Eleusine</i> Gaertn.	<i>Isachne</i> R. Br.
<i>Cenotheca</i> Desv.	<i>Eragrostiella</i> Bor.	<i>Leersia</i> Soland.
<i>Coelachne</i> R. Br.	<i>Eragrostis</i> P. Beauv.	<i>Leptaspis</i> R. Br.
<i>Cynodon</i> Rich.	<i>Glyceria</i> R. Br.	<i>Leptochloa</i> P. Beauv.
<i>Desmostachya</i> Stapf	<i>Halopyrum</i> Stapf	<i>Lepturus</i> R. Br.

Limnopo C. E. Hubb.*Lopholepis* Decne*Microchloa* R. Br.*Oropetium* Trin.*Phalaris* Linn.*Poa* Linn.*Sporobolus* R. Br.*Thysanolaena* Nees*Tragus* (Hall.) Scop.*Zenkeria* Trin.*Zoysia* Willd.

1. Spikelets 1-flowered

2. Inflorescence a panicle

3. Leaves narrow, linear ; spikelets bisexual

4. Spikelets laterally compressed ; glumes absent or reduced to an obscure, hyaline ; entire or 2-lobed rim ; lemma and palea obliquely oblong, strongly 1-keeled, keels bristle-ciliate ; usually in or around marshy places ...

Leersia

4. Spikelets terete ; glumes well developed, the lower sometimes minute ; lemma ovate or oblong, glabrous ; usually in dry localities ...

Sporobolus

3. Leaves broad, obovate or oblanceolate, narrowed to a short petiole-like base, tessellately nerved ; spikelets unisexual ; male and female spikelets in the same panicle, often a group of few female spikelets at the base and the male spikelet or spikelets terminal on the branchlets ...

Leptaspis

2. Inflorescence of spikes or spiciform racemes

5. Racemes or spikes solitary

6. Spikelets not shaped like the head of a bird

7. Spikelets sessile

8. Spikelets appressed to or sunken in the hollows of the joints on opposite sides of the readily disarticulating rhachis ; lower glume absent ; upper glume tailed ...

Lepturus

8. Spikelets not as above ; lower glume reduced, suppressed or present ; upper glume not tailed

9. Both lower and upper glumes present, similar, glabrous ; spikelets alternate and secund in two closely approximate rows ; spikes often curved ...

Microchloa

9. Often the lower glume suppressed or when present minute, hyaline ; the upper glume narrowly lanceolate, acuminate, 5-ribbed, ribs armed with hooked spinules ; spikelets in clusters usually of 2 facing each other, seldom 3-6 ; raceme erect ...

Tragus

7. Spikelets on very short, stout pedicels, appressed to the rhachis ; leaves very narrow, convolute, rigid ; spikelets ovoid, laterally compressed ; glume single, coriaceous ; in sea-shores ...

Zoysia

6. Spikelets shaped like the head of a bird ; lower glume incumbent on the upper, consisting of a globose base and a cymbiform limb ; keel with a narrow cartilaginous wing, pectinately ciliate with spinules hooked at the tip ...

Lopholepis
Cynodon

5. Spikes 2-8, umbellate ; spikelets laterally compressed, alternately biseriate, imbricate ...

1. Spikelets 2- to many-flowered

10. Inflorescence of panicles

11. Herbs

12. Florets 2

13. Lemmas obtuse or acute, veins not prominent ; lemmas and paleas glabrous or puberulous, not long ciliate, rhachilla not bearded ; spikelets not laterally compressed

14. Lower floret male or bisexual

15. Panicles loose, spikelets many ; glumes deciduous, upper lemma becoming indurated ...

Isachne

15. Panicles contracted or spiciform, spikelets few ; glumes persistent ; upper lemma membranous ...

Coelachne
Hubbardia

14. Lower floret empty ; pendulous herb from wet-rocks ...

13. Lemmas acute or caudate-acuminate, prominently several-veined, hairy below the middle ; palea long-ciliate ; rhachilla bearded ; spikelets laterally compressed ...

Zenkeria

12. Florets 3-many

16. Leaves parallel-veined ; lemmas without deflexed bristles

17. Panicles lax or contracted

18. Spikelets few-many-flowered

19. Spikelets erect

20. Lemmas not hyaline at tips

21. Lemmas 5-7-nerved ; spikelets with a few florets ...

Poa

21. Lemmas 3-nerved ; spikelets usually with many florets ...

Eragrostis

20. Lemmas with a broad hyaline tip ; panicles narrow ; paleas 2-toothed, keels narrowly winged upwards ...

Glyceria

19. Spikelets pendulous ; branches and pedicels capillary ; panicles effuse ; glumes scarious or membranous, boat-shaped and keeled or saccate and rounded on the back ; paleas 2-keeled, keels often winged ... *Briza*
18. Spikelets 3-flowered ; panicles contracted ; 2 lower florets barren and reduced to the lemmas or one or both absent ; glumes equal and as long as the spikelet ... *Phalaris*
17. Panicles spiciform
22. Spikelets many flowered
23. Panicles ovoid, elongate, branches spiciform ; rhachilla silky hairy ; leaves convolute, narrow, rigid ; lemmas coriaceous, distichously imbricate, ovate-oblong, cymbiform, mucronate or apiculate ; in coasts ... *Halopyrum*
23. Panicles long, often interrupted below ; branches more or less spreading ; spikelets closely packed and more or less 2-ranked ; leaves rigid, tips setaceous ; lemmas rigidly membranous, acute or sub-acute ; usually in sandy soil ... *Desmostachya*
22. Spikelets 3-flowered ; 2 lower lemmas empty, the upper minutely tuberculate, often transversely corrugate in the upper half, narrowed at the base into a false pedicel, sulcate on the back, the uppermost lemma with a small basal tubercle on either side ... *Ehrharta*
16. Leaves with transverse veins ; upper lemmas usually with soft, erect, ultimately deflexed tubercle-based bristles ; keels of paleas ciliate ... *Centothea*
11. Shrubs tall, reed-like with solid terete culms ; leaves broad, cordate, flat ; panicles compound, large, effuse ; spikelets numerous, 2-3 flowered ; upper lemmas ciliate ... *Thysanolaena*
10. Inflorescence of spikes, heads or racemes
24. Inflorescence of spikes or racemes
25. Inflorescence of spikes
26. Spikes solitary
27. Rhachis compressed, undulating, alternately distichously hollowed ; spikelets more or less sunk in the hollows ; lower glume minute or absent ... *Oropetium*
27. Rhachis straight, slender, not hollowed ; spikelets secund ; lower glumes well developed ... *Eragrostiella*
26. Spikes few in a whorl occasionally 1-2 solitary spikes below the whorl ; spikelets 2-3 seriate, secund, imbricate ... *Eleusine*
25. Inflorescence of racemes
28. Raceme solitary ; rhachis and pedicels flattened ; florets 2 ... *Limnopoia*
28. Racemes few, racemously arranged on a common peduncle ; rhachis and pedicels terete ; florets upto 7 (1 in *Leptochloa neesii* & *L. uniflora*) ... *Leptochloa*
24. Inflorescence of oblong or globose heads ; spikelets 6-many flowered ; glumes apiculate, mucronate or cuspidate ; paleas as long as the lemmas, broadly cuneate, 3-lobed, lobes crose, flaps broad, 2-keeled, keels smooth or ciliate ; glumes and lemmas softly villous ... *Aeluropus*

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